DOCUMENT RESUME

ED 167 508 SP 013 762

AUTHOR Friesen, Charles D.
TITLE The Results of Homework Versus No-Homework Research Studies.
PUB DATE Jan 79
NOTE 19p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Academic Achievement; *Correlation; Educational Research; Elementary Secondary Education; *Homework; *Performance Factors

ABSTRACT

This report summarizes the results of 24 research studies on the correlation of homework and no homework and academic achievement. The studies were conducted over the years from 1923 to 1976 in elementary and secondary schools. The results of the studies do not provide a clear-cut endorsement for either homework or no homework. It is suggested that individual teachers are best equipped to decide which of the two methods to use in order to maximize student achievement. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED167508

SP 013 762

The Results of Homework Versus No-Homework Research Studies

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Charles D Friesen

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

Charles D. Friesen

The University of Iowa

January, 1979

THE RESULTS OF HOMEWORK VERSUS NO-HOMEWORK RESEARCH STUDIES

Introduction

The issue of homework has long been of interest to teachers and researchers. The earliest reported study summarized in this paper was conducted in the early 1920's. Many of the early studies designed to determine the relative effectiveness of homework assignments were poorly designed. Some of the more recent homework versus no-homework studies have been both designed and reported in a very professional manner. A summary of the research studies will now be reported.

The Studies

Beauchamp (1923) studied the techniques involved in the mastery of high school science. He concluded that definite assignments, regardless of type, result in superior test performance.

Ten years later Carmichael (1933) reported the results of a study he conducted between 1927 and 1932. The study focused upon the achievement of all the students in grades five through eight enrolled in an El Segundo, California elementary school. During the first three years the children were assigned homework, while during the last three years no homework was assigned. Although Carmichael's study is limited because he did not equate his groups, his conclusions are noteworthy. A slight, but non-significant, difference favoring the homework group was found on a battery of Stanford Achievement Tests.

In a follow-up study Crawford and Carmichael (1937) found a drop in high school grades among those pupils who had attended the El

Segundo elementary school after homework was abolished there. Crawford and Carmichael concluded that if home study is once abolished, the pupil has difficulty in returning to it.

Steiner (1934) reported that the results of his experiment in a single seventh-grade class indicated that regular homework led to gains in achievement in arithmetic and English grammar. Thirty-nine students were involved in the one semester study. Two equivalent groups of students were formed on the basis of mental ability and achievement tests. One group received arithmetic homework while the second group received English homework. The amount of time spent on homework was the same for the two groups. The homework was collected and corrected by the teachers on a daily basis. Small, but consistent, differences were found in favor of the homework group. Steiner concluded that daily home-study assignments of a drill nature in arithmetic and English grammar tended to accelerate learning as measured by standard tests in these subjects.

An experiment conducted by Cooke and Brown (1935) involved pupils in grades five through eight in Birmingham, Alabama. They investigated the relationship between the amount of homework and scholastic achievement. The New Stanford Achievement Test, Advanced Examination was administered as both a pretest and a posttest. The study spanned three months. The parents of the students reported the amount of time their school children spent studying arithmetic, history, and reading. Cooke and Brown reported no significant relationship between the amount of time spent doing homework and scholastic achievement.

Teahan (1935) investigated the value of homework in sixth, seventh, and eighth grade arithmetic classes. Three teachers, using identical teaching methods, were involved in the 115 day study. Each teacher taught four classes at one of the grade levels. In two of the four classes homework was assigned at least three times a week. The other two classes received ro homework. The Stanford Achievement Test was used as both a pretest and a posttest. Teahan found no significant difference between the achievement of the two groups.

One of the most extensive studies of homework in the elementary school was made by Di Napoli (1937). He sought to determine whether compulsory homework resulted in improved academic achievement. The experiment was conducted in six New York City schools selected as representative of different neighborhoods and involved 1,200 fifth and seventh grade students. One-half of the children were required to do regular homework assignments, which were checked and included in the final grade. The other half were given voluntary homework--topics for home study suggested by both the teacher and the children--that was not graded. Di Napoli found that fifth graders with compulsory homework performed slightly better than their control counterparts, whereas the reverse tended to occur for the seventh graders. These results, he concluded, once again pointed out the importance of other factors and the need for flexibility in dealing with assignments.

Anderson (1946) conducted an experiment in which one group of junior high school students received homework assignments and another group did not have homework. Each group contained 29 students. The

students receiving regular homework assignments showed higher achievement gains in English, social studies, and mathematics than those students not receiving homework.

Anderson found that while bright students in the non-homework group achieved almost as well as the bright students in the homework group, the average and below average students in the non-homework group were much less successful than their counterparts in the homework group.

Schain (1954) reported a limited experiment among students in an American history class. He found that the bright students did well with or without homework, but that they did slightly better with homework. The average students did much better on daily quizzes and on essay tests when they had regular homework assignments. The students with low IQ's seemed lost without homework and achieved at a higher level when in the homework group.

Strang (1955) pointed out that there was a general trend toward no homework in the primary grades, some in the middle grades, and a consistent amount of homework in the high schools. She also stated that in the elementary schools the correlation between school marks and time spent on homework is very small.

Hines (1957) conducted a year-long experiment to determine the effect of homework on achievement in two plane geometry classes. Nineteen matched pairs were formed on the basis of age, intelligence, and first-year algebra grades and then randomly assigned to the two classes. The experimental group received no homework and the control group received homework two or three times each week.

The results of the study showed: (1) that the scores on every test given during the year favored the homework group, (2) the differences between the two groups were greater on cumulative tests than on chapter tests covering more recent materials, and (3) if students were graded on tests only, homework would increase the grade of the average student by one letter grade. Several factors limit the validity of Hines' study. The final results used only sixteen of the original nineteen matched pairs. Also, each group was taught by a different teacher. Hines stated that it is possible that the differences found could be accounted for by differences in skill or zeal on the part of the two teachers involved.

Schroeder (1960) conducted a study to determine whether the time spent on homework in first-year algebra results in increased achievement. Students in the experimental group completed their daily assignments during the class period. Control group students had daily assignments to be completed outside of class time. The results of standardized tests showed no significant difference in achievement between the two groups. Teacher-made tests favored the homework group over the non-homework group. However, only the last test showed a significant difference between the two groups. Schroeder concluded that the benefits of assigning homework in elementary algebra are questionable.

Goldstein (1960) reviewed thirty years of research on homework and concluded that preconceived ideas about the value of homework

have often interfered with the interpretation of research findings. The results of most homework research are inconclusive and statistically insignificant, Goldstein reported, but the few significant findings seem to suggest that homework favors higher academic achievement in the upper elementary and secondary grades, for some pupils, in some subjects.

Hudson (1965) investigated the relationship between the amount of assigned homework and its effect upon scholastic achievement. Six seventh grade classes in Fayetteville, Arkansas participated in the study. The non-homework group received supervised study time during which time the next day's assignment was completed. The homework group received at most ten minutes of supervised study for the next day's assignment. In addition, they were assigned one-fourth more problems than the non-homework group.

Hudson found the amount of homework assigned has no statistically significant relationship to scholastic achievement in arithmetic concepts. Scholastic achievement in arithmetic problem-solving may be influenced by the amount of homework assigned.

Koch (1965) reported an experiment conducted to examine the value of homework in sixth grade arithmetic. The purpose of the study was to examine: (1) whether daily practice at home, in addition to regular lessons in class, would increase achievement in arithmetic and (2) whether a long daily assignment (approximately thirty minutes) or a shorter one (approximately fifteen minutes) would have more influence on achievement for these pupils. A total of 85 students

in one school were assigned to one of three classes, each taught by a different teacher. The Iowa Tests of Basic Skills-Form 1 were administered prior to the experiment and revealed that the three classes did not differ significantly. During the ten week study one class received the long assignment, one class received the short assignment, and the third class received no assignment.

Koch's statistical analysis (analysis of variance) revealed that the daily homework assignments were a significant factor in raising the achievement level of learning the area of arithmetic computation as measured by the Iowa Tests of Basic Skills-Form 2. The mean gain scores for the long, short, and no homework assignment classes were 8.58, 3.45, and 2.27 respectively. Arithmetic problem-solving mean gain scores for the three classes were 2.58, 4.59, and 3.90 respectively and were not significantly different.

The purpose of a study designed by Whelan (1966) was to examine the effect of systematic homework assignments in English and arithmetic on the achievement of fourth grade students. Four hundred students were equated by age, sex, intelligence and subject-matter achievement and assigned to either the experimental or the control group. A total of 100 homework sheets were assigned to the students in the experimental group in each of the subject areas. The control group received no homework sheets.

Whelan chose to use Iowa Tests of Basic Skills as a criterion measure. He reported that completion of systematic homework assignments

in English and arithmetic by the experimental students did not result in scores significantly higher than those made by the control group. No significant differences were noted on the factors of sex and ability when comparing the experimental and control groups.

Mason (1967) conducted a study in a college algebra course to determine the relative merits of requiring homework. The required homework group consisted of 241 students, while the non-homework group contained 191 students. Each of the teachers involved in the study taught a homework class and a non-homework class. Mason found no significant differences in achievement between the homework and the non-homework group when averaged over all teachers. The significance level of teacher by method interaction was .005. Mason concluded that each teacher should determine which of the two methods to use in order to be most effective as a teacher.

Ten Brinke (1967) investigated the effect of homework on the achievement of 108 seventh and eighth grade students. The fifty-four students at each grade level were assigned either to a homework class or a supervised class. The homework classes received daily assignments which were to be completed outside the class period. These assignments were corrected and collected at the beginning of the succeeding period. The supervised class received a somewhat shortened daily assignment about midway in each class period. Approximately one-half of the class time was used for supervised study. During this time the teacher moved from student to student to provide help and direction.

Statistical analyses revealed no significant difference in mean achievement between the homework classes and the supervised classes in the areas of computation, problem solving, and facts. A breakdown of the two groups by the factors of sex and ability level revealed no significant differences in achievement when compared with their counterparts in the other group. There was some evidence that indicated a differential effect of homework toward superior achievement for upper ability students and of supervised study toward superior achievement for low ability students.

Four elementary schools in Osseo, Minnesota provided the setting for a study conducted by Maertens (1968). Three third grade classrooms from each school were involved in the experiment. All classrooms used the same arithmetic book and followed the curriculum suggested in the text. The 342 pupils were randomly assigned to classrooms within each of the schools. The teachers followed their normal instructional procedures during the experiment. The only variable was the type and amount of homework. The three treatments consisted of: (1) no homework outside of class work, (2) homework assigned in accordance with the normal classroom procedures, and (3) experimenter-prepared homework assignments in addition to certain numbers of pages in the student's text. All three treatments were assigned to each classroom during different periods of the school year, so that students were given teacher-prepared homework during one period, experimenter-prepared homework during one period, and no homework during a third period. Each treatment lasted for one-third of the school year.

The statistical analysis showed that arithmetic homework did not have a significant effect upon the arithmetic achievement as measured by tests of knowledge of arithmetic processes, computational skill, and problem solving ability. Maertens reported that there were no significant differences within the three ability levels determined by the Lorge-Thorndike Intelligence Test. The effect of arithmetic homework upon the attitudes of the students toward school, homework, arithmetic, teacher, and reading was not significant and student attitudes did not differ significantly by ability levels.

Gray and Allison (1971) reported the results of an eight week study which investigated the effect of homework on the achievement of sixth grade students. The students were studying the four fundamental operations with fractions. The 55 students were randomly assigned to one of the two treatment groups. Treatments I consisted of the regular classroom instruction with no assignments. Treatment II received similar classroom instruction but, in addition, received three twenty minute homework assignments per week. At the end of four weeks the treatments were reversed. In the statistical analysis four sets of pre-test scores were used as covariates, and two sets of post-test scores were used as criterion measures. The results indicated that there was no statistical difference between the two groups in computation skills or the understanding of the subject matter. Gray and Allison concluded that perhaps the three-day-a-week homework should have been extended to five days a week and should have consisted of a constant number of exercises rather than the constant twenty minutes of homework.

Taylor (1972) compared the effects of two different approaches to handling homework on the achievement and attitude of Algebra I and Geometry I students. One approach made homework compulsory, with the work being handed in to the teacher for evaluation. The other was a non-compulsory approach to homework, where the student's work was never evaluated by the teacher. Achievement and attitude tests were administered prior to the eighteen week study. The results of the study showed that compulsory homework could not be justified solely on the basis of achievement and attitude scores. However, questionnaires showed that both students and parents wholeheartedly endorsed the compulsory homework method.

A trigonometry and two calculus classes at a public two-year college in California provided the setting for Hansen's (1972) study. Each of these experimenter-taught classes was divided into experimental and control groups. In the experimental groups each student received regular daily homework assignments, which were to be completed and returned to the instructor by the next class meeting. These assignments were corrected and promptly returned. The trigonometry and one of the calculus experimental groups received credit for the homework. The control groups did not receive homework assignments.

To measure achievement gains during the eight week experiment, equivalent forms of standardized achievement tests were administered prior to and upon the conclusion of the study. The results showed no significant difference between the adjusted means of the post-test scores of the two groups. On two investigator-designed examinations

the trigonometry homework group scored higher than the no-homework group. Hanson kept time logs for each student on which he recorded the time they had spent studying since the last class meeting. He found that the trigonometry and calculus homework students: (1) spent larger amounts of time in study than did the no-homework students, and (2) reported fewer days of no study and more days of uninterrupted study.

Doane (1973) studied the effects of homework on arithmetic achievement, using a sample of white, middle class, suburban fourth grade pupils. Half of the pupils received homework during the instructional period and an equivalent group, matched on the basis of arithmetic performance, received no homework during the instructional period. Four performance levels were formed within each of the two treatments.

Doane reported these findings: (1) there was a significant difference in arithmetic achievement scores between the students assigned homework and the students who did not have homework assignments, (2) students in the highest performance level profited most from homework ($r = .79$, $p < .001$), and (3) there was a descending order of non-significant correlations ranging from a slightly positive correlation at the second performance level to almost no relationship at the third level to a slightly negative relationship with the students at the lowest level of performance.

Harris (1973) sought to determine the relationship between homework assignments and achievement. In several experiments with elementary school children, he found that when the students were given daily

homework assignments in social studies and mathematics, relatively few children completed the assignments and that student performance was only slightly affected. However, by providing consequences for accurate completion of homework, the number of students accurately completing the homework assignments was increased. In addition, assignment of homework and consequences for accurate completion of homework was associated with increased accuracy of performance in the classroom as compared with times when no homework was assigned.

Schmidt (1974) investigated the influence of compulsory homework without quizzes and non-compulsory homework with quizzes on the achievement and attitude of 269 students enrolled in Calculus II. Students in the compulsory homework sections handed in homework on a weekly basis. Students in the non-compulsory homework sections were given the same problems and encouraged to work them. They were given a short quiz each week. Four hour exams and a final exam were used to measure achievement. An attitude scale, constructed by Schmidt, was administered before and after the study.

Schmidt found that there was no statistically significant difference in either achievement or attitude between the compulsory homework sections without quizzes and the non-compulsory homework sections with quizzes.

The purpose of a study conducted by Parrish (1976) was to examine the effects of two types of homework on achievement and attitude toward mathematics. In this study two teachers each taught four classes of

ninth grade Fundamentals of Mathematics classes. The concept of percentage was being studied for the duration of the study. Two classes from each teacher were randomly selected for the drill homework group. The other two classes from each teacher were placed in the no-homework group.

A random sample of 15 sets of scores from each of the eight classes was used in the analysis of results. Parrish found that the students in the drill homework group achieved at a significantly higher level than those in the no-homework group. There was no difference in the attitudes toward mathematics of the two groups.

Summary

A majority of all homework studies have been concerned with whether homework was better than no homework. This was especially true of the studies conducted prior to 1950. Swenson, Cost, and Taylor (1955) summarized the research on homework before 1950 by stating that while an occasional study seemed to indicate slight advantages associated with home study, most of the research was unfavorable to homework.

After analyzing many of the homework studies, Goldstein (1960) pointed out that very little conclusive evidence against homework was produced in any of them. He noted that several researchers, including DiNapoli, had drawn negative conclusions when their evidence did not support such conclusions. Goldstein suggested that there was reason to believe that homework was of value in promoting achievement in the basic subjects, in developing independent research skills and in promoting independent study habits.

The results of the studies reported do not provide a clear-cut endorsement for either the homework or the no-homework groups. This may be explained by the results Mason's (1967) study. He reported a significant teacher by homework method (required homework and no-homework groups) interaction and concluded that each teacher should determine which of the two methods to use in order to maximize student achievement.

BIBLIOGRAPHY

Anderson, William Ewart. "An Attempt Through the Use of Experimental Techniques to Determine the Effect of Home Assignments Upon Scholastic Success," Journal of Educational Research, 40 (October, 1946), 141-43.

Beauchamp, Wilbur I. "A Preliminary Experimental Study of Techniques in the Mastery of Subject Matter in Elementary Physical Science," Studies in Secondary Education, Vol. I. Chicago: University of Chicago, 1923.

Carmichael, Jacob A. "An Experimental Study of the Value of Homework." Unpublished Master's thesis, University of Southern California, 1933.

Cook, Dennis H. and Gregory B. Brown, Jr. "Home Study Has Many Angles," Journal of Education, 118 (October, 1935), 409-410.

Crawford, C. C. and Jacob A. Carmichael. "The Value of Home Study," The Elementary School Journal, 38 (November, 1937), 194-200.

DiNapoli, Peter J. Homework in the New York City Elementary Schools. Teachers College, Columbia University Contributions to Education. No. 719. New York: Bureau of Publications, Teachers College, Columbia University, 1937.

Doane, Bradford Sayles. "The Effects of Homework and Locus of Control on Arithmetic Skills and Achievement in Fourth Grade Students," Dissertation Abstracts International, 33A:5548, April, 1973.

Goldstein, Avram. "Does Homework Help? A Review of Research," The Elementary School Journal, 60 (January, 1960), 212-224.

Gray, Roland F. and Allison, Donald E. "An Experimental Study of the Relationship of Homework to Pupil Success in Computation with Fractions," School Science and Mathematics, 71 (April, 1971), 339-46.

Hansen, David Williams. "An Investigation of the Effects of Required Homework on Achievement in College Mathematics," Dissertation Abstracts International, 33A:2814-15, December, 1972.

Harris, Virgil William. "Effects of Peer Tutoring, Homework and Consequences Upon the Academic Performance of Elementary School Children," Dissertation Abstracts International, 33A;6175, May, 1973.

Hines, Vynce A. "Homework and Achievement in Plane Geometry," The Mathematics Teacher, 50 (January, 1957), 27-29.

Hudson, James A. "A Pilot Study of the Influence of Homework in Seventh Grade Mathematics and Attitudes Toward Homework in the Fayetteville Public Schools," Dissertation Abstracts, 26:906, August, 1965.

Koch, Elmer A. Jr. "A Study of the Effect of Homework on Arithmetic Achievement at the Sixth Grade Level", The Arithmetic Teacher, 12 (January, 1965), 9-13.

Maertens, Norbert William. "An Analysis of the Effect of Arithmetic Homework Upon the Arithmetic Achievement of Third Grade Pupils," Dissertation Abstracts, 28A:4535, May, 1968.

Mason, Lysle C. "A Study of the Influence of Compulsory Homework on the Achievement of College Students in College Algebra," Dissertation Abstracts, 28A:56, July, 1967.

Parrish, Doris C. "An Investigation of the Effects of Required Homework Versus No Homework on Attitudes Toward and Achievement in Mathematics," Dissertation Abstracts International, 37A:2040, October, 1976.

Schain, R.L. "Another Homework Experiment in the Social Studies," High Points, 36 (February, 1954), 5-12.

Schmidt, Gary E. "The Effectiveness of Large Lecture Recitation Sections Versus Small Group Classes and the Influence of Compulsory-Homework-and-Quizzes on the Achievement and Attitudes of Calculus II Students," Dissertation Abstracts International, 35A:222, July, 1974.

Schroeder, Harold A. "Homework Versus No-Homework in Elementary Algebra." Unpublished Master's thesis, Mankato State College, 1960.

Steiner, M.A. "Value of Home-Study Assignments," School and Society, 60 (July 7, 1934), 20-24.

Strang, Ruth M. Guided Study and Homework: What Research Says to the Teacher. No. 8. Prepared by the American Educational Research Association in cooperation with the Department of Classroom Teachers of the National Educational Association. Washington, D.C.: National Education Association, 1955.

Swenson, Esther J., James C. Cost, and Greene Y. Taylor. "Research on Homework," Journal of Education, 137 (March, 1955), 20-22.

Taylor, Harold Doyle. "A Comparative Study of Compulsory Homework Versus Non-Compulsory Homework in Algebra I and Geometry I at Hillsdale High School," Dissertation Abstracts International, 32A: 3876, January, 1972.

Teahan, Gladys E. "Required Home Study is Unwise," The American School Board Journal, 91 (November, 1935), 41.

Ten Brinke, Dirk Pieter. "Homework: An Experimental Evaluation of the Effect of Achievement in Mathematics in Grades Seven and Eight," Dissertation Abstracts, 27A:4176, June, 1967.

Whelan, Joseph Arthur. "An Analysis of the Effect of Systematic Homework in Two Fourth-Grade Subjects," Dissertation Abstracts, 26:5143, March, 1966.